## Robotics

Course Instructor: Ms. Anjana Jain

**Length of Course:** One Semester

**Credits:** 0.5

**Course Description:**

In this course, students are introduced to the field of Robotics. The course is designed to make students aware of the diverse and dynamic world of automation and technology. Students understand the mechanical construction processes, electronic components and circuits as well as algorithms and logical problem solving. Students learn the complete engineering process as they design and build their own robot to tackle a given challenge.

**Course outcome:**

21st century skills: teamwork, problem solving, brainstorming, reasoning, research, time management, & presentation.

Technology skills: programming, design, systems, & communication

Engineering skills: hypothesis & evidence, observation & prediction, error analysis, experimental design, prototyping, electronics, machining, modeling

**Content outline:**

Strand 1: Basic construction processes

Measuring, drilling, cutting, lathe work, soldering, & wiring

Strand 2: Theory and research

Technological History

Electronic components

The General Robot system, Robot Sensors, Applications of Robots

Socio-cultural issues

Strand 3: Programming

Construct modular programs to change robot behavior

Strand 4: Design

Principles of good design

Using 3D modeling tools

Design evaluation

Strand 5: Assembly

Assemble from a kit

**Assessment:**

Assessment is based on class discussions, Labs, Home Work, Quizzes, Projects and assignments.

Each quarter contributes to 50% of the semester grade.

One big project each quarter.

**Class Journal:**

Will be used to store handouts, worksheets, project schedules, notes from design reviews, copies of programs, and sketches. This folder is graded at the teacher’s discretion. It is a tool that allows students to keep their work organized.

**Expectations:**

Students are working with tools and equipment that needs to be handled with care. All instructions have to be followed. There is a zero tolerance when machine work is being carried out; safety is most important. Students are responsible for kits, tools and other supplies issued to them. Each student is expected to share responsibility of team projects. Students would be expected to put in time outside of class to carry out research work and complete work that they missed due to excused/ unexcused absence.